

We claim:

1. An isolated heart homing peptide that selectively homes to cardiac tissue.

2. The isolated heart homing peptide of claim 1, comprising an amino acid sequence selected from the group consisting of:

GGGVFWQ (SEQ ID NO: 2);

HGRVRPH (SEQ ID NO: 3);

VVLVTSS (SEQ ID NO: 4);

10 CLHRGNSC (SEQ ID NO: 9); and -

CRSWNKADNRSC (SEQ ID NO: 10), or a functionally equivalent modification thereof.

3. The isolated heart homing peptide of claim 2, having a length less than forty amino acids.

4. The isolated heart homing peptide of claim 2, having a length of less than fifteen amino acids.

5. The isolated heart homing peptide of claim 2, comprising the amino acid sequence GGGVFWQ (SEQ ID NO: 2), or a functionally equivalent modification thereof.

6. The isolated heart homing peptide of claim 5, comprising the amino acid sequence GGGVFWQ (SEQ ID NO: 2).

7. The isolated heart homing peptide of claim 6, which is GGGVFWQ (SEQ ID NO: 2).

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8. The isolated heart homing peptide of claim 2, comprising the amino acid sequence HGRVRPH (SEQ ID NO: 3), or a functionally equivalent modification thereof.

5 9. The isolated heart homing peptide of claim 8, comprising the amino acid sequence HGRVRPH (SEQ ID NO: 3).

10. The isolated heart homing peptide of claim 9, which is HGRVRPH (SEQ ID NO: 3).

10 11. The isolated heart homing peptide of claim 2, comprising the amino acid sequence VVLVTSS (SEQ ID NO: 4), or a functionally equivalent modification thereof.

15 12. The isolated heart homing peptide of claim 11, comprising the amino acid sequence VVLVTSS (SEQ ID NO: 4).

13. The isolated heart homing peptide of claim 12, which is VVLVTSS (SEQ ID NO: 4).

20 14. The isolated heart homing peptide of claim 2, comprising the amino acid sequence CLHRGNSC (SEQ ID NO: 9), or a functionally equivalent modification thereof.

25 15. The isolated heart homing peptide of claim 14, comprising the amino acid sequence CLHRGNSC (SEQ ID NO: 9).

16. The isolated heart homing peptide of claim 15, which is CLHRGNSC (SEQ ID NO: 9).

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17. The isolated heart homing peptide of claim 2, comprising the amino acid sequence CRSWNKADNRSC (SEQ ID NO: 10), or a functionally equivalent modification thereof.

5 18. The isolated heart homing peptide of claim 17, comprising the amino acid sequence CRSWNKADNRSC (SEQ ID NO: 10).

10 19. The isolated heart homing peptide of claim 18, which is CRSWNKADNRSC (SEQ ID NO: 10).

20. A conjugate, comprising a heart homing peptide linked to a moiety,

15 said heart homing peptide comprising an amino acid sequence selected from the group consisting of
GGGVFWQ (SEQ ID NO: 2);
HGRVRPH (SEQ ID NO: 3);
VVLVTSS (SEQ ID NO: 4);
CLHRGNSC (SEQ ID NO: 9); and
20 CRSWNKADNRSC (SEQ ID NO: 10), or a functionally equivalent modification thereof.

21. The conjugate of claim 20, wherein said moiety is selected from the group consisting of a therapeutic agent, a detectable agent and a tag.

25 22. The conjugate of claim 20, wherein said therapeutic agent is a vascular endothelial growth factor (VEGF).

23. The conjugate of claim 20, wherein said therapeutic agent is a fibroblast growth factor (FGF).

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24. A method of treating a cardiovascular disease in a subject, comprising administering a conjugate comprising a heart homing peptide linked to a therapeutic agent,

5 said peptide comprising an amino acid sequence selected from the group consisting of

GGGVFWQ (SEQ ID NO: 2);

HGRVRPH (SEQ ID NO: 3);

VVLVTSS (SEQ ID NO: 4);

10 CLHRGNSC (SEQ ID NO: 9); and

CRSWNKADNRSC (SEQ ID NO: 10), or a functionally equivalent modification thereof.

25. The method of claim 24, wherein said cardiovascular disease is atherosclerosis.

15 26. The method of claim 24, wherein said cardiovascular disease is restenosis.

27. An isolated peptide that selectively homes to ischemic tissue.

20 28. The isolated peptide of claim 27, which is a peptide comprising the amino acid sequence CRSWNKADNRSC (SEQ ID NO: 10), or a functionally equivalent modification thereof.

29. The isolated peptide of claim 28, having a length of less than forty amino acids.

25 30. The isolated peptide of claim 28, having a length of less than fifteen amino acids.

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31. A conjugate, comprising a peptide that selectively homes to ischemic tissue, said peptide linked to a moiety.

32. The conjugate of claim 31, said peptide comprising the amino acid sequence CRSWNKADNRSC (SEQ ID NO: 10).

33. The conjugate of claim 32, wherein said moiety is selected from the group consisting of a therapeutic agent, a detectable agent and a tag.

34. A method of treating ischemic disease in a subject, comprising administering a conjugate comprising an ischemic tissue selective peptide that selectively homes to ischemic tissue, said peptide linked to a moiety.

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